STRATA

The Non-Expert Dilemma

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April 2019

INTRODUCTION

We are Randy Simmons and Ken Sim. Randy is a university professor of political economy and Ken provides environmental professionals across the world with rugged handheld units that improve their ability to measure and monitor environmental conditions. We have both worked on environmental policy issues for several years. This collection of essays details our ideas about how non-professionals might start to think systematically about energy issues.

THE NON-EXPERT DILEMMA

When Randy was a young assistant professor, he and his wife built a new home in Providence, Utah, a 7000-person town at 4600 feet elevation in the high desert near the Utah/Idaho border. The house is a double envelope solar design and they could not have afforded to build it without solar tax credits provided by the state of Utah. They were energy-conscious and had an earth-bermed design approved by the city council but switched designs to the solar option after consulting books, magazine articles, and engineers. They thought they were on the leading edge of passive solar home design and assumed others would see the advantages of their home over one relying on natural gas, especially as natural gas prices were predicted to skyrocket over the next decade. It turned out that a better metaphor for them being on the leading edge is being caught in a cul-de-sac.

Their assumptions, as well as those of many energy "experts" about energy prices and availability, were dead wrong. New, well-insulated houses were soon almost as energy efficient as their solar house at much less cost and did not get as cold at night. Thank goodness their bank required them to install back-up heat as a condition for getting a loan. But the Simmons have found they actually like living in this particular technological cul-de-sac. Solar heat, augmented with a wood-burning stove when necessary, provides a comfortable balance. A 400 square foot solarium is a key feature for the two floors on the south side of the home. The solariums are certainly not living space but they like them. Today, a now-25-year-old-tree they planted when they built the home shades part of the solarium during the hottest months and sheds its leaves to let in the winter sun. They have discovered only a few plants that can live with the tree in the solarium as winter temperatures in the solarium swing from 35 degrees to 100 and back again in 12 hours. Besides, there is a certain sense of superiority that comes from being able to say, "I live in a solar home."

Feelings of superiority aside, they would have never built this home without the tax credits. Although Janet and Randy love their house, if they were building new today, they would not build a solar home. Natural gas is plentiful and will be for at least the next 1000 years and produces heat even when the sun does not shine. Having 800 square feet of solarium space that is only comfortable to be in part

of the year is a luxury they would not afford again. The tax credit for solar builds in (1981) was equivalent to 1/6 of the cost of the home when they built it The tax credit was the main driver of their decision to choose the design over more conventional ones. Their building decision was influenced, “nudged” if you will, by state tax policies enacted by well-meaning legislators and generally well-meaning, if also self-interested, solar lobbyists. Only two other homes were built with a similar design in their mountain valley of about 100,000 people. Everyone else apparently paid attention to market signals, not tax policies.

During their time in Providence, Randy spent six years on the city council and four years as mayor. He was amazed at how many decisions the city council had to make or approve on subjects council members knew little about -- the size of a new city water storage tank, slope restrictions on hillside subdivisions, appropriate materials for the park strip between the sidewalk and the street, the interest rate on a new water or sewer bond, which city to partner with on sewage treatment, the best kind of sewage treatment plant, whether to top-coat roads with a new polymer material or traditional chip-and-seal, how to price city water so people might conserve (but not so much that the stream of income needed to pay off the water bond was insufficient), evaluating the fairness of differential pricing between low and high water users , how might climate change affect water supplies, should the city subsidize youth sports, should a portion of the electricity purchased in the city be from renewable sources? It all made him wonder why did he ever ran for office in the first place.

Elected officials face an information and expertise dilemma much like the one Janet and Randy faced when deciding about home designs. Elected officials are continually faced with the dilemma of creating policy regarding issues for which they have no specialized, or even generalized training. They face what can be called a non-expert dilemma. The natural response to a non-expert dilemma is to find people who are experts and rely on them. Relying on scientists for advice

about policy is, however, just substituting one kind of non-expertise for another. An engineer can explain the best size, in his opinion, to make a new water storage tank, but he has no special expertise on the question of whether it is fair to burden future taxpayers with bond payments or whether there are political problems with size or location. A scientist may be an expert on how to build complex computer models, but have no expertise about the policy implications of the model's output. Assume, for example that climate change is caused by human activities. That scientific conclusion provides no guidance about what policies should be enacted. It is not possible to move directly from science to policy, regardless of what many claim.

Citizens also face the non-expert dilemma. That does not stop them, however, from claiming expertise when attending city council meetings and legislative hearings, writing letters to the editor or to their Members of Congress, or just arguing over Thanksgiving dinner. In Randy's ten years in city government he seldom heard people argue from a position that did not reflect their self interest. Recognizing that citizens are self-interested and also lack expert knowledge, elected officials are left to grope in the dark with many policy questions. The Providence City Council members listened (generally politely) to citizens, considered the claims of engineers (who often argued with each other), and made the best guess they could, given their own views and the pressures of politics.

Policies about energy production, distribution, reliability, and sources are non-expert problems. Most people want energy to be abundant and affordable. The problem for politicians is to try to sort between competing claims and make decisions, all while knowing they are groping in the dark.

We are non-experts attempting to think systematically about energy policy. We do not have deep expertise in any of the subjects we will discuss, that is, we are not nuclear engineers or climate scientists. But we know something about political processes. In an ideal world there would be less politics and more reliable expertise. Even in that world, however, science would not be more important to decision processes than politics.

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Politics is about balancing risks, making tradeoffs, and considering the demands of constituents. The voice of science is only one of the voices in the great cacophony heard by politicians.

Political decisions will always be imperfect. For a deep understanding of why that is the case see Randy's book Beyond Politics. For now it is sufficient to note that imperfect people, acting with imperfect information, in a world of competing values can never know the "right" choice. But choices continue to be made and some of them are even necessary.

One of the great drivers of political decisions in all arenas but especially energy is a fear of risk. We risk running out of oil; harming the poor by turning corn into ethanol; creating a warmer world; harming endangered species as we site new fossil fuel power plants, wind farms, solar fields and build transmission lines from them; destroying the social fabric of rural communities; reducing property values; permanently destroying wild lands; polluting groundwater; creating long-term environmental damage from mining for the components of electric vehicle batteries and from disposing of them, nuclear meltdowns, flooding from ruptured dams, etc. These are all claims that politicians and their advisors hear as proposals are made to build new power generating plants or transmission lines.

In his book Searching for Safety, the great American political scientist Aaron Wildavsky (who died in 1993) specifically addressed the power of fear of risk in everyday personal and political decisions. He used the familiar story of Moses and the Children of Israel. Upon reaching the borders of the promised land, they sent a reconnaissance party to assess the risk of entering versus staying in the desert. The advance party returned with tales of giant people and giant clusters of grapes as well as pomegranates and figs. Only Joshua and Caleb thought the grapes, pomegranates, and figs were worth taking the risk of invading. The others were too afraid and chose the safety of the desert over the unknown risk of invasion, despite the potential of gaining a land of "milk and honey." The result was 40 more years of wandering in the desert. Wildavsky was a modern Joshua who argued we should embrace risk because that is the only source of safety. He makes four points that are especially important for dealing with the non-expert dilemma:

- Safety and risk are intertwined.

- Wealthier is safer and healthier.
- Anticipation creates less safety than does resilience.
- Safety is better thought of as an ongoing search process, rather than a destination.

The idea that safety and risk are intertwined is basic common sense. We would not have the massive increases in natural gas supplies had state and local jurisdictions not allowed drilling companies to use hydraulic fracturing (fracking) to extract oil and gas from shale formations. By contrast, the Obama administration decided the risks were too great to allow fracking on federal lands so during that administration we did not see the increases in discovery and production on federal lands seen on private lands in North Dakota. Similarly, New York state will not allow fracking while Massachusetts does. There are substantial differences in prices and economic growth between adjoining counties in the two states. Introducing small modular nuclear reactors faces similar hurdles. Policymakers want proof they will be safe. But, proving something is safe before trying it is an impossibility. It is also a recipe for stagnation.

Wealthier is healthier almost everywhere. More children per 1000 in poorer countries die than in richer countries. Living in a rich, industrialized country means being exposed to industrial chemicals, air pollution, nuclear waste from many sources including hospitals, and pesticides. But, people living in a rich, industrialized country are much healthier than those living in a poor, non industrialized country. Those in richer countries have fewer health problems, which means as they live longer they are also able to live an active lifestyle not available to their poorer, less healthy counterparts in poor countries.

The two strategies available to individuals and societies for dealing with the consequences of risk are anticipation and/or resilience. Most of the debate about energy consumption and climate change policy is based on anticipation. If we can anticipate the future harms, the claim goes, we can avoid them by reducing fossil fuel consumption. The goal is to anticipate what is likely to happen sometime in the future and stop it from happening. We will discuss these issues in later papers, but for now we note that an effective anticipation strategy requires knowledge we do not have--the extent and depth of consequences, the actual probability of those consequences, and whether there will be effective remedies. All this

is a big knowledge problem and making wrong assumptions can waste resources that could be used for other purposes and even make things worse.

Resilience requires shedding some of the natural fear of risk and relying on experience with risky events in order to overcome problems and take advantage of opportunities. It also requires living with risk and learning from it. It means we will have information in the future we do not have today and that solutions will evolve that few if any can anticipate today. Resilience, then, requires less ability to predict the future than is assumed by a strategy of anticipation. It does require more growth in wealth and knowledge that comes from experience. Experience means trials and errors, which incidentally produces more future safety.

Safety comes from the process of trial and error. It does not come from the "precautionary principle," which assumes that we should allow no new technologies or products about which there is uncertainty about environmental or health effects. Wildavsky described the precautionary principle as "a marvelous piece of rhetoric. It places the speaker on the side of the citizen—I am acting for your health—and portrays the opponents of the contemplated ban or regulation as indifferent or hostile to the public's health."[1] The actual source of safety comes from comparing environmental or health gains with costs. If a regulation reduces wealth, in all likelihood it also reduces health. The precautionary principle does not allow for such comparisons or such a dynamic view. It is static, and assumes remaining frozen in place is superior to taking actions. It also emphasizes a single value, health, or environment, or climate over all other values. Is there a moral norm stating that climate or health ought to be our only or dominant value? We think not. Wildavsky believed, "Emphasizing a single value, to which all others must be subordinated, is a sign of fanaticism." He asked,

> How much is a marginal gain in health worth compared with losses in other values such as freedom, justice, and excellence?" The answer will vary by individual. A Patrick Henry, for instance, will not thank you for attempts to protect life at the expense of liberty.[2]

In future papers we apply a Wildavsky-like analysis to questions of energy. We

1 Aaron Wildavsky and Adam Wildavsky. "Risk and Safety." *The Concise Encyclopedia of Economics.* 2008. Library of Economics and Liberty. Retrieved November 21, 2017 from the World Wide Web: http://www.econlib.org/library/Enc/RiskandSafety.html

2 Ibid.

consider health, wealth, anticipation, and resilience. One goal is to restore energy discussions to a place where they can be held without the moral sanctimony imposed by the precautionary principle. A second goal is to help citizens, regulators, and lawmakers understand energy policy. We address practical questions of where the energy we use daily comes from as well as energy myths, such as peak oil. We examine why globally wind energy produces just 0.7% of total energy use despite massive subsidies and why Germany built 10 gigawatts of coal fired generating plants since 2010. We try to do all this in a way that a non-expert can think more clearly about our energy present and future.